

SELF-ALIGNED DOUBLE-GATE MOSFET BY SELECTIVE EPITAXY AND SILICON WAFER BONDING TECHNIQUES

ABSTRACT

A structure and a method of manufacturing a double-gate metal oxide
5 semiconductor transistor includes forming a laminated structure having a single
crystal silicon channel layer and insulating oxide and nitride layers on each side of
the single crystal silicon channel, forming openings in the laminated structure,
forming drain and source regions in the openings, doping the drain and source
regions, forming a mask over the laminated structure, removing portions of the
10 laminated structure not protected by the mask, removing the mask and the
insulating oxide and nitride layers to leave the single crystal silicon channel layer
suspended from the drain and source regions, forming an oxide layer to cover the
drain and source regions and the channel layer, and forming a double-gate
conductor over the oxide layer such that the double-gate conductor includes a first
15 conductor on a first side of the single crystal silicon channel layer and a second
conductor on a second side of the single crystal silicon channel layer.